

**REPORT TO THE  
50TH MONTANA LEGISLATURE  
ON THE  
RENEWABLE ENERGY  
AND  
CONSERVATION PROGRAM**

January 1987

MONTANA ENVIRONMENTAL QUALITY COUNCIL

Capitol Station

Helena, MT 59620

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## EXECUTIVE SUMMARY OF RECOMMENDATIONS

1. The Department of Natural Resources and Conservation should develop a plan for renewable energy and conservation technologies for the 1987-89 biennium, including federal energy program efforts, and incorporating the following:

a. An evaluation to determine if additional investment of state funds in renewable energy and conservation technologies is warranted and where the investment would be most effective;

b. A summary of the accomplishments of the renewable energy grant and loan program;

c. Investment criteria, including but not limited to preferential consideration for technologies that have the greatest potential to reduce reliance on non-renewable energy sources and that promote economic development in Montana.

2. Under the auspices of the Renewable Energy and Conservation Program the Department of Natural Resources and Conservation should assume a leadership role in bringing federal, state and regional agencies, local governments, utilities, rural electric cooperatives and private sector organizations together to develop a comprehensive and coordinated approach to achieve both the short and long term energy conservation objectives of the various involved organizations on a statewide basis.

3. The plans developed as a result of Recommendations 1 and 2 should specifically identify the areas of technology research and development and technology transfer that should be emphasized by the Renewable Energy and Conservation Program and identify how that emphasis will be achieved.

4. Managers of the Renewable Energy and Conservation Program and the Science and Technology Program should formally define the relationship of the two programs and, as appropriate, differentiate separate areas of emphasis.

5. The State of Montana should formally assess whether the current array of renewable energy and conservation-related tax incentives, purchase of conservation and electricity from renewable energy sources by public utilities as regulated by the Public Service Commission, and the direction of the Renewable Energy and Conservation Program are creating the greatest market stimulation effect at least cost.



## I. BACKGROUND

In 1975, the Montana Legislature adopted the nation's first state-funded financial incentive program to develop emerging renewable energy technologies (see Appendix A). The Renewable Energy and Conservation Program's (RECP) stated purpose was to decrease Montana's reliance on non-renewable fossil fuels, and increase the use of solar, wind, biomass, geothermal, and small-scale hydro renewable energy sources. Funded by a percentage of coal severance tax revenues, the program provided for the research, development, and demonstration of these energy sources.

The Legislature assigned the Montana Department of Natural Resources and Conservation (DNRC) to administer the program. DNRC began issuing grants to individuals and businesses in 1976. In its first few years, the program concentrated heavily on solar technologies. But as more emphasis was placed on individual energy technologies, new competition for renewable energy grants developed. Technologies for a variety of renewable energy sources matured at the same time the program was coming under closer scrutiny by the Legislature and the public. This interest was especially high because the coal severance tax funded the program.

The program's original legislation has been changed several times since its adoption. The first legislative change in 1981 established a loan program to stimulate the fledgling renewable energy industry and thus give a broader range of Montanans an opportunity to choose from a variety of commercial renewable energy options.

The second 1981 legislative action lowered the percentage of the coal severance tax that was allocated to fund the program from 5 percent to 4.5 percent. However, because coal tax revenues were increasing at that time, the change did not result in fewer dollars to fund the program.

The third 1981 legislative change, and in fact the second one as well, reflected a dissatisfaction among the majority of legislators with the administration of the program to that point. Many legislators believed that there had been no demonstrable reduction of the state's reliance on fossil fuels. Charges surfaced about favoritism in issuing grants and about too much emphasis on solar technologies that benefited only a select group of "insiders." In addition, many legislators felt a lack of grant follow-up, reporting, and financial accountability detracted from the program's effectiveness.

Within this context, Representative Joe Quilici (D-Butte) sponsored HB 398 in the 1981 session, which sought to correct these deficiencies and tighten administration of the program. The bill limited the funding of demonstration projects to those with good potential for saving non-renewable energy, and prohibited funding demonstration projects similar to unproductive projects in close geographic proximity to a similar project, and projects that did not fit within the goals of the statute. In addition, the legislation required DNRC to monitor grants and loans and report to the Legislature on the effectiveness of funded projects or programs. Representative Quilici's bill also required DNRC



to submit periodic reports to the Environmental Quality Council (EQC) for review and evaluation, and directed the EQC to make recommendations to assure the greatest possible benefit from the program to the people of the State of Montana.

In the 1983 session, Senator John Mohar (D-Libby) sponsored SB 356, which sought to clarify project eligibility for grants and loans from the alternative energy research development and demonstration account, to provide for the inclusion of research, development and demonstration of energy conservation, and to remove the prohibition on private ownership and control of research information. This action was prompted by DNRC's observations that energy conservation activities were not formally considered under the RECP, and that many individuals were withholding attractive grant proposals for fear of losing patent rights to alternative energy technologies. SB 356 was enacted in 1983 to address these changes. At its inception, the RECP program was explicitly mandated only to explore and develop renewable energy options. The legislature initially considered energy conservation a separate type of development and felt that adequate efforts already existed in this area. As the RECP developed, however, DNRC found that renewable energy development and conservation activities were often closely interrelated. Tying conservation techniques to renewable energy generation would induce both efficiency in energy consumption and alternative energy development.

The 1985 legislative session produced several new laws that reduced the RECP's funding level for the next biennium and added a new component to the program.

HB 812, introduced by Representative Dorothy Bradley (D-Bozeman) created the Science and Technology Development Board to "strengthen and diversify Montana's economy by establishing a public-private sector partnership to encourage scientific and technological development within the state..." The Board was funded for the biennium with a one-time allocation of \$2 million from the renewable energy account in FY 85. The purpose section of the bill noted that DNRC was not planning to use the entire allocated amount it would have received for the RECP.

HB 919 reduced the rate of funding for the alternative energy research development and demonstration account from 4.5% to 2.5% of coal tax revenues from June 30, 1985 to July 1, 1987. This bill, introduced by Representative Francis Bardanouve (D-Harlem), reallocated the revenues to the general fund and the highway program. The RECP budget was also affected by a directive from the Legislature instructing DNRC to use RECP earmarked funds for the state's match of federal energy programs. While some RECP funds were previously used for the state matching share, the amount increased beginning in FY 86.

The transfer of funds from the RECP is a reflection of revenue deficits in state government as a whole, changes in a number of economic factors that affect the rate of development of renewable energy sources, the current regional and worldwide energy supply situation, and the need for economic revitalization in Montana. The Northwest region currently has a surplus of electric energy that is expected to last well into the next



century based on current load growth projections. There is also a worldwide oversupply of oil and a national oversupply of natural gas which have driven prices to the lowest levels in over a decade. The rate of development of renewable energy sources has slowed as a direct result because these sources are not among the cheaper alternatives for either utilities or individual consumers. Also, federal tax credits for business and residential investments in renewable energy sources and conservation expired at the end of 1985 and have not yet been renewed. The renewable energy industry, particularly solar energy-related businesses, has significantly declined as a result.

Considering the current energy surplus, low prices of conventional energy forms, and declining state revenues, a majority of legislators felt that major continued investment of public funds in renewable energy and conservation research and development should be deferred.

HB 909, introduced by Representative Rex Manual (D-Fairfield) in the 1985 session, added energy conservation in state buildings as a new component eligible for grants from the RECP. The DNRC indicated that energy conservation retrofit of state buildings would provide measurable, significant savings of both energy and dollars and would also have important demonstration value. This program component is discussed in more detail later in this report.

Further reductions in RECP revenues were approved during the Legislature's special session in June 1986 when \$1,350,000 was transferred from the alternative energy research development and demonstration account to the general fund by HB 39, introduced by Representative Ray Peck (D-Havre) (\$1 million was transferred from the account at the end of FY 86, another \$350,000 will be transferred to the general fund during FY 87, and DNRC's FY 87 appropriation was reduced by \$1,350,000). The DNRC was authorized to reallocate funds among grants, loans, grants to state agencies for building conservation, program administration, matching federal energy programs and petroleum violation escrow account money, based on availability of funds. Finally, the DNRC was authorized to elect not to allocate funds or accept grant and loan applications from July 1, 1986 through June 30, 1987.

The purpose of this report is to review actions by DNRC addressing the most recent legislative changes in the RECP, including the reductions in funding, and to review EQC oversight activities. Conclusions and recommendations are also included. This report will not concentrate on details of the program such as specific projects funded or eligibility requirements.

## II. RECP REVENUE

Table 1 compares RECP appropriations, expenditures and the unobligated cash balance remaining (or projected to remain) in the fund at fiscal year end for FY's 84 through 87. The administration's budget proposals for FY's 88 and 89 are also included. The decrease in uncommitted funds in the renewable energy account beginning in FY 86 reflects both the transfer of funds for other purposes and reduced revenues coming into the account. During FY's 84, 85 and 86 the DNRC did not spend all of

TABLE 1

RENEWABLE ENERGY AND CONSERVATION PROGRAM  
APPROPRIATIONS AND EXPENDITURES<sup>1</sup>

<u>Fiscal Year</u>	<u>Appropriation</u>	<u>Expenditures</u> <sup>2</sup>	
1984	\$2,955,064	\$1,267,054	(grants/unsolicited)
		129,950	(grants/RFP's)
		550,005	(loans)
		402,278	(administration)
		13,293	(federal match)
		<u>\$2,362,580</u>	
(Unobligated, year-end cash balance in the account: \$1,612,152)			
1985	\$3,336,614	\$ 448,759	(grants/unsolicited)
		77,213	(grants/RFP's)
		806,940	(loans)
		401,360	(administration))
		18,392	(federal match)
		<u>\$1,752,664</u>	
(Unobligated, year-end cash balance in the account: \$2,641,011)			
1986	\$2,388,718	\$ 560,372	(grants)
		174,982	(loan)
		287,528	(state buildings)
		311,845	(administration)
		139,963	(federal match)
		<u>\$1,474,690</u>	
(Unobligated, year-end cash balance in the account: \$1,676,467)			
1987	\$2,223,000	(Projected)	
	(by 1985 Legis)	\$ 407,093	(grants)
		0	(loans)
	\$819,000	259,757	(administration)
	(by 6/86	135,770	(federal match)
	special	<u>\$ 802,620</u>	
	session)		
(Projected unobligated, year-end cash balance in the account: \$0)			
1988	\$ 253,450	\$ 0	(grants/loans)
(Proposed)		138,719	(administration)
		114,731	(federal match)
		<u>\$ 253,450</u>	
1989	\$ 252,336	\$ 0	(grants/loans)
(Proposed)		138,436	(administration)
		113,900	(federal match)
		<u>\$ 252,336</u>	

<sup>1</sup>Source: DNRC. <sup>2</sup>Centralized Service Division expenditures not included.



its appropriation for the RECP. The two appropriation figures reported for FY 87 reflect the amount originally allocated by the 1985 Legislature and the amount remaining after the June special session.

### III. DNRC ACTIVITIES

Over the past 1½ years DNRC has devoted a significant portion of RECP-related efforts to setting up the state building conservation retrofit component of the program. For several months during FY 86 it was uncertain whether DNRC would sponsor a grant/loan cycle. There were also questions about whether the DNRC should view conservation in state buildings only as an additional use for RECP funds or whether the 1985 Legislature had intended for DNRC to emphasize this new program element to the exclusion of other program components such as grants and loans to the private sector. An underlying issue is whether the public is better served by grants/loans to the private sector for research and development in a variety of renewable energy and conservation project areas, by reduced costs of government due to conservation in state buildings, or by some combination of the two.

The DNRC believes that conservation in state buildings has several advantages that make it a more attractive investment of RECP funds than grants and loans, considering the present energy surplus and state revenue deficits. DNRC has also indicated that with limited RECP funds available, a multifaceted program is more difficult to administer. For example, the grant/loan program requires considerable staff time which may not be justified when there are limited funds to distribute.

DNRC has stated that conservation in state buildings will have important demonstration value for commercial building owners and will result in documented energy savings. The energy savings will translate into dollar savings for the general fund and reductions in the cost of government. Also, impacts of eventual energy price increases will be lessened. It should be noted that many building conservation measures pay for themselves in very short time periods. Conversely, there is often no way to predict or measure the specific savings or advancement of RECP goals that result from grants and loans to the private sector for research and development projects.

Several concerns have emerged in relation to the state building component of the RECP. According to DNRC, conservation retrofits funded through the RECP complement the overall state building program because energy conservation has not historically been emphasized. Some legislators have voiced concern that agency managers should be aggressively seeking ways to conserve energy using their existing budgets, without added financial assistance from the RECP. Agency managers, however, were initially not enthusiastic about participating in the RECP because agencies receiving grants for conservation retrofit were required to have their budgets reduced commensurate with the estimated energy savings resulting from the grant. This requirement removed a monetary incentive for managers to participate. There were also uncertainties about whether "estimates" of energy savings would prove to be an accurate or acceptable basis for calculating budget



reductions. A related concern of some legislators is that the reduction in agency budgets would translate into savings for the general fund but would return nothing to the RECP account.

DNRC proposed deleting the repayment requirement during the June special session. However, the legislature amended the requirement to provide that each agency awarded a grant must either repay the grant or reduce its budget commensurate with the "documented" energy savings. DNRC is currently writing rules to implement the state building-related component of the RECP, including the repayment/budget reduction provision.

In November 1985 DNRC announced its intention to sponsor a grant and loan cycle during the spring of 1986, and proposed that 50% of the available funds be committed to state buildings and 50% to other projects such as grants/loans. Ultimately the awards were split approximately 72% for grants/loans and 28% for state buildings (see Table 1).

Appendix B is a listing of the grants, loans and state building conservation grants awarded from the RECP for FY 85 and FY 86. Funding was committed to four state buildings in FY 86 (three on the Montana State University (MSU) campus and the Billings Highway Division complex). Prior energy efficiency studies were completed on these buildings, and in some cases matching funds were available for energy retrofit. Also, both the Highway Department and MSU officials were very interested in accomplishing the conservation retrofits. In addition to the four state buildings that have received grants to date, DNRC has received applications for energy audits on more than 200 buildings which are listed in Appendix C. DNRC plans to award additional retrofit grants to selected buildings during approximately the first quarter of 1987. For FY's 88 and 89 DNRC has requested oil overcharge funds to retrofit state buildings.

Over the past two or three years DNRC has not received as many grant and loan project proposals as in the past. The department feels that the quality of the projects has increased, and that the recent proposals receiving funding have been more complex and costly than in the past. Also, more projects are being submitted by university researchers or professional firms than by individuals.

DNRC is not planning to sponsor a grant or loan cycle during FY's 87, 88 and 89, according to its proposed budget (see Table 1) and is planning to award grants only for state buildings in FY 87. The Department has received unsolicited requests during FY 87 for grants unrelated to state buildings. Two that involve additional work by current grantees have been funded. As other unsolicited proposals are received, they will be evaluated to determine whether they are critical or highly advantageous to fund. If so, they will be further evaluated according to the criteria normally used to select grantees and could be funded this year.

DNRC staff continue to monitor conservation and renewable technology development through federal programs administered by the department and by reviewing literature. In the biomass area two staff engineers



participate in the biomass energy program sponsored by the U.S. Department of Energy through the Bonneville Power Administration. Staff also keep abreast of technology development by monitoring active grant and loan agreements and through site inspections.

There are no DNRC employees currently funded completely by the RECP. Employees work on a variety of programs according to their expertise and the needs of the programs. Some federally funded programs have informational components similar to what was previously funded through the RECP, including workshops and a variety of publications. A portion of RECP funds continue to be used to leverage federal funds by providing matches for four programs, including the Energy Extension Service, State Energy Conservation Program, Institutional Conservation Program and Biomass Utilization and Cogeneration Program.

#### IV. RENEWABLE ENERGY ADVISORY COUNCIL

The Renewable Energy Advisory Council (REAC) is a group of citizens with expertise in alternative energy and conservation who are appointed by the DNRC director and are responsible for providing policy guidance to the RECP and evaluating grant and loan applications. In January 1986 REAC made the following recommendations concerning the direction of the RECP:

- 1) The grant and loan program should emphasize biomass and energy conservation topics rather than solar, wind and hydro. Biomass and energy conservation appear to have the most remaining research questions and potential to further reduce non-renewable energy use. These two topic areas also have more need for assistance that is within the scope of the RECP, since the rate of wind, hydro and solar technology development is heavily influenced by the rates utilities will pay to purchase electricity from small developers.
- 2) Conservation in state buildings should be treated as only a pilot project at this time.
- 3) The RECP should emphasize projects that show commercial potential and projects that are linked to Montana's economy, such as agriculture and forestry. Grant or loan applications should indicate how each proposal will lead to commercialization. DNRC's evaluation should include a market assessment of proposed projects and their products.
- 4) Site-specific or project-specific feasibility studies that would primarily benefit an individual or company by sale of renewable energy to utilities should be de-emphasized.
- 5) Individuals with good ideas in any renewable energy or conservation topic area should continue to be able to apply for funding from the RECP. Therefore, some type of unsolicited grant cycle should be continued.

These recommendations were implemented through the 1986 grant/loan cycle. The projects receiving grants were, for the most part, continuations of on-going research and development efforts, many of

which had previously received RECP support. One loan was awarded to expand a project that had received an initial loan through the program. Also, as discussed in another section of this report, four state buildings received funding. DNRC has stated that it will evaluate unsolicited proposals but applicants are also being encouraged to seek other sources of funding.

## V. THE SCIENCE & TECHNOLOGY PROGRAM

The Science and Technology (S & T) program was created within the Department of Commerce to stimulate economic development by financially supporting technology-based business and industry. The objective is to encourage development and use of new and innovative technologies that might be viable in Montana in either new businesses or traditional industries. If commercialization efforts are successful program funds must be paid back by project sponsors. Also, 50 percent matching funds are required from the private sector for each project. The key factor used to evaluate project proposals is whether they demonstrate a clear path to commercialization and have economic development potential. Proposals may be submitted in eight technology areas one of which is energy.

There has been discussion over the biennium about the relationship of the RECP and S & T program. For example, the S & T program is focused on the commercialization phase of technology development. Some legislators have expressed concern that research and development efforts should receive more emphasis. Proposals received by the S & T program to date have indicated more applicant interest in obtaining funding for seed capital (31 summary proposals requesting over \$4.9 million) than for applied research and development activities (22 proposals requesting slightly over \$2.1 million). The orientation of the RECP over the years has been to encourage long term research and development of renewable and conservation technologies in order to reduce reliance on non-renewable energy sources. More recently, there also appears to be some consensus that it is important to channel scarce RECP funds to projects or technology areas that have the potential for commercialization and that will have a positive effect on Montana's economy.

To date the energy-related proposals funded by the S & T program have included one clean coal research project (\$350,000) and one wind generation technology research project (\$30,000). Of 64 summary proposals received by the S & T program as of November 1986, 13 were classified as energy-related. Counting the two that have been funded, the topics represented in the 13 proposals include the following: 1 geothermal, 3 energy-efficient building technology, 2 biomass, 3 engine design, 2 wind and 2 coal.

A comparison of the 64 applicants that had filed summary proposals with the S & T program as of November 1986 and applicants that have received funding from the RECP in the past indicates that two applicants have received funding from both programs (although not necessarily for the same project or type of research activity) and three applicants have



received funds from one program and applied for funds from the other program. A complete listing of unsuccessful applicants for RECP funds over the past ten years was not available, but an informal review of the S & T applicant list by DNRC staff indicates that seven applicants have requested funds from both programs but have not been awarded grants.

## VI. JOINT MEETING OF THE LAND RESOURCES SUBCOMMITTEE AND THE REAC

EQC's Land Resources Subcommittee and the REAC co-sponsored a meeting in May 1986 to obtain public input in assessing the status of renewable energy and conservation technologies and the future of the technologies in Montana. Several speakers at the meeting stated that while renewable energy and conservation technologies are not presently cost-effective in many cases because of low oil prices, numerous compelling reasons remain for encouraging their development, including the likelihood of future non-renewable energy supply crises. It was suggested that government should address the problem of achieving a secure supply of energy and that it is not reasonable or prudent to delay or reduce research and development of conservation and renewable sources.

DNRC staff provided a series of technical presentations concerning the status of individual renewable and conservation technologies in Montana, based on the current situation of low oil prices and corresponding reductions in the cost-effectiveness of many renewable technologies. These presentations are summarized below.

### 1. Solar

Three categories of solar technology were discussed, including: 1) those that are already commercialized and cost-effective, and that therefore do not require further government assistance; 2) those that are still too expensive to be cost-effective due to equipment cost and maintenance or because there is not a large enough market; and 3) those that are potentially feasible but not yet fully developed. DNRC monitors technologies in the first category in order to provide information and technical assistance to the public and monitors improvements in equipment and other factors that will bring down the cost of technologies in the second category. The third category is the focus of the RECP.

The solar resource in Montana is good but not outstanding. The most common application of solar technology is for domestic hot water, but it is not competitive with either natural gas or electricity in Montana unless the demand is high and all the solar energy can be used. Sun spaces and sun-tempering in buildings are cost-effective. Active solar space heating is not economically competitive due to high equipment cost, the cost of maintenance, complexity of the equipment and the difficulty of integrating the systems with back-up heat sources. Solar steam and electric steam generation are similarly uncompetitive in Montana. The RECP has given more money to solar than any other technology and hence DNRC has obtained the best understanding of this technology's cost-effectiveness.

Two areas of solar technology development with high potential include photovoltaics and commercial scale day-lighting. The latter has not received very much attention to date but likely will in the future. Photovoltaics are currently economically feasible only where a site is extremely remote and has to have power. However, the cost of photovoltaic energy is going down and use of the technology is likely to become much more widespread.

## 2. Geothermal

There are over one hundred low-temperature geothermal resources in Montana. The primary uses are swimming pools and some space heating. Geothermal can also be used for electric generation, but in Montana this is not cost-effective. One problem is the isolated nature of the resource and its distance from potential users. Under the circumstances there is little that can be accomplished with geothermal, except to watch for specialized applications. Sewage treatment and heat for subdivisions are two possible geothermal applications that the DNRC is monitoring.

## 3. Hydroelectric Generation

Hydroelectric generation contributes a sizeable percentage of the power supply in the Pacific Northwest. It is a reliable and dependable technology that is capable of operating at high system efficiency and at the lowest cost per kilowatt-hour of any electrical technology in use today. There is still a large undeveloped hydro resource in the Northwest primarily for small-scale systems, including small mountain streams, undeveloped potential at existing dams, municipal water systems and irrigation canals and ditches. Estimates of undeveloped hydroelectric potential in Montana range from 500-1500 megawatts not including streams and canals where no water flow records exist.

Hydro is a mature technology. The probability of further significant advancement is low. The most recent development is in more cost-effective turbo machinery for ultra low-head sites. The cost of small-scale hydro systems is dependent on site-specific conditions such as water availability, quality and type of system design, site preparation work, site access, distance from transmission facilities, terrain features and environmental considerations. The main environmental concerns being raised in Montana are adverse impacts on fish habitat due to dewatering stretches of streams during low water periods of the winter.

There is currently about 60-70 megawatts of small-scale hydroelectric projects in some stage of development in Montana. Most of the activity is concerned with feasibility assessment and planning.

There are a number of impediments to hydro development including regulatory changes by the Federal Energy Regulatory Commission that make licensing procedures and exemptions more cumbersome and expensive, the expiration of federal tax credits for renewable and alternative energy investment, and low prices for energy from alternative/renewable sources



(i.e., utility "buy-back" rates) due to the present surplus of electricity in the region.

#### 4. Wind

Renewed interest in wind-generated electricity since the early 1970's has spurred the development of larger and more complex systems for more efficient use of the wind resource. First-generation machines had numerous performance problems. Current technology machines are at least three or four times more reliable than systems of 10-15 years ago. Monitoring has led to a better understanding of the physical properties of the wind and improvements in machine siting techniques. The cost of electricity produced by wind machines has been reduced ten-fold since the early 1980's. Nevertheless, further advances are required if wind energy is to be competitive with power supplied from other sources. Technical goals that have been identified for wind energy by federal programs include further reductions in installed cost and operating/maintenance costs, improved reliability and improved life expectancy.

Wind energy development in Montana has been limited and sporadic. There have been two wind farm developments and numerous single machine installations to date. A number of areas in Montana have a sufficient wind regime for energy development and Montana has the largest potential wind resource availability in the Pacific Northwest. However, utility buy-back rates have not been sufficient to accommodate the cost of development.

#### 5. Biomass

Biomass is any organic matter which is available on a renewable basis, including forest residues, agricultural crops and wastes, wood and wood wastes, animal wastes, livestock operation residue, food processing wastes, and municipal wastes. Plants, trees, garbage, manure, and vegetable oils are all forms of biomass that can be used to produce energy, including electricity, mechanical power, and space and process heat. Since agriculture and the wood products industry are key sectors of the Montana economy there is great potential for developing the waste resources from these industries in order to provide jobs and supply local energy needs. Current conversion technologies include alcohol fermentation, anaerobic digestion, densification, direct combustion, and cogeneration, mostly from waste material.

As of May 1986 there were four plants in Montana fermenting alcohol from grain with annual production of about 3.5 million gallons per year. There are plans to increase the capacity to 5 million gallons. A number of cities including Helena and Great Falls are currently employing anaerobic digestion of sewage to collect biogas. According to 1983 statistics about 11.5 megawatts of electricity is being produced in Montana from cogeneration projects. The state also presently has three wood pellet densifiers and 30-40 commercial and institutional boilers using wood waste.

More needs to be done to enhance the commercial viability of biomass technology including identifying the factors that make a viable project, such as resource availability, applicability of the collection and conversion technology to the end use, designs for specific locations, economic analysis, financing and efficient operating practices.

DNRC is producing a handbook on biomass licensing and permitting. The department is also interested in development of less costly and more efficient processes for converting grains and possibly cellulose materials to alcohol fuels, and development of computer programs for small bioenergy producers to use to determine preliminary project feasibility. The use of anaerobic digestion to dispose of animal wastes is an area for further research. New technologies for recovering, processing and converting wood biomass to fuel also need further development.

Biomass technologies that could be applied in Montana include: 1) gasification of waste material to replace oil, gas and diesel fuel for use in engines, pumps, generators, and boilers/furnaces; 2) processes for extracting landfill gas in a more cost-effective manner; 3) liquefaction and pyrolysis processes for converting waste material to a more densified energy form; and 4) oil seed extraction processes (especially from safflowers) for replacing or extending diesel fuel.

#### 6. Residential and Commercial Energy Conservation

U.S. Department of Energy and Bonneville Power Administration (BPA) funds have been a major source of support over the past several years for research to determine the cost-effectiveness of conservation techniques in Montana, for disseminating conservation information to the public, and for training members of the shelter industry. Incentive payments are also available from BPA to encourage more energy-efficient building practices.

Commercial conservation programs have not been as comprehensive as residential programs. There is an on-going information outreach effort and DNRC provides technical assistance for small businesses and consumers. The federally funded Institutional Conservation program include efforts to analyze and retrofit school and hospital buildings. Also, the state building conservation component of the RECP will increase DNRC's experience and ability to provide information for retrofitting commercial buildings in the state. Consumer motivation is considered the most critical aspect for achieving energy conservation.

#### 7. Technology Summary

Land Resources Subcommittee members, REAC members and interested citizens participated in small group discussions in the following technology areas: a) wind and hydro; b) solar and geothermal; c) agricultural biomass; d) wood product biomass; e) commercial conservation; and f) residential conservation. Each group addressed the following questions: 1) Do you agree with DNRC's assessment of the status of this technology in Montana? If not, what are the significant



differences? 2) What do you see as the future role of this technology in Montana, considering the current energy surplus, and looking beyond the projected surplus? Do you agree with DNRC's assessment? 3) What are the most appropriate roles of the public and private sectors in the development of this technology in Montana in the short and long term? The results of the small group discussions are reported below.

a. Solar

Future solar technology development efforts should primarily focus on reducing costs in order to make the technology more competitive. Investment in an aggressive education and demonstration program on photovoltaics would be desirable because this technology offers the most opportunity for cost-effective application in Montana. Some examples include lighting highway signs, running irrigation systems, particularly sprinkler or drip systems in order to conserve both water and energy, and meeting peak demand on utility systems. Photovoltaic systems can be installed much more quickly than conventional electric generation facilities such as coal plants. Also, photovoltaics could be used to provide power to ranches, water well pumps, and communication facilities in remote locations. Education efforts would be enhanced by developing and distributing photovoltaic kits for use in high school science classes.

Passive solar technology has reached full commercial status because the up-front installation costs will be recovered by the homeowner/builder within four to nine years through lower utility bills.

b. Hydro

Hydroelectric generation has a long term role in Montana. There are some impediments to development including the length of time required for permitting and licensing, low utility buy-back rates, and the problem of finding venture capital. Montana banks have been reluctant to provide loans, perhaps because they are not familiar enough with the technology. Continued financial assistance for hydro development from state government would be desirable although the Science and Technology program may be the most logical funding source. The state could also do more to convince banks that hydro development projects are worthwhile.

c. Wind

The wind resource is available in Montana and the technology for electric generation is proven. However, low utility buy-back rates and reliability are impediments to further technology development. Additional research is needed to increase the stability of wind machines.

d. Biomass

Biomass enzyme and safflower oil research are examples of projects funded through the RECP that are likely to be commercialized and contribute to Montana's agricultural economy. Alcohol production

needs to become more efficient and requires further research. Wood pelletization technology is currently commercial and it will have a role in home and institutional heating in Montana. However, it may not be competitive with natural gas and electricity. Gas and liquid fuels from wood biomass are still in research status, and both the public and private sectors need to encourage development of this technology.

#### e. Commercial Energy Conservation

Commercial conservation has not received enough emphasis, but there is uncertainty about how best to provide the necessary assistance. Third-party financing is an attractive alternative but it works best only with large businesses and buildings. Commercial conservation also includes institutional and government buildings. DNRC's approach to retrofitting state buildings is generally acceptable, especially if funds from settlement of oil industry overcharges are available. The demonstration value of retrofitting public buildings should be emphasized. The Board of Investments could explore investment of state funds in state building retrofit because it is one of the most attractive ways to earn a return. A few buildings should be retrofitted as completely as possible, both to be effective in saving energy and to enhance the demonstration value.

Further effort is needed to educate the private sector concerning the opportunities and benefits of conservation in commercial buildings. Education efforts could be focused on public accountants because of their role in advising business owners about the most efficient means of conducting their operations. Utilities are providing some education through energy audits, but the commercial sector has not been emphasized enough. Commercial conservation efforts could be linked to building a better business climate. DNRC should obtain more input from businesses and the private sector when designing programs for them. In summary, there is considerable knowledge of how to accomplish conservation. The main question is how best to transfer the knowledge to building owners.

#### f. Residential Energy Conservation

DNRC should coordinate the efforts of the various public and private sector entities working on residential energy conservation in Montana, including utilities, manufacturers and private contractors. The coordination effort should focus on identifying problems, setting goals and proposing solutions. DNRC should also take the lead in coordinating efforts to incorporate higher levels of energy conservation in the Montana building codes. There should be more assessment of new residential conservation technology before installing measures in buildings where people will live. If the measures do not perform as expected this creates unnecessary problems. More public education is needed to increase understanding that conservation is important even in a time of regional energy surplus.

#### Meeting Summary

The meeting facilitator, Dr. Lauren McKinsey, summarized the main points of discussion and potential future directions for renewable



and conservation technologies in Montana. Many of the small groups called for more investment in specific renewable and conservation technologies, but funds are scarce. In order to design an integrated and reasonable program there needs to be a mechanism for comparing the various investment possibilities in order to decide where best to commit scarce public funds. In addition to comparing technologies, the various steps of the technology development process (research, demonstration, commercialization) need to be scrutinized in order to determine where the public interest will best be served. If a technology is a long way from commercialization perhaps it should not receive public support when funds are scarce.

The key question is how to invest limited funds in order to best capture or capitalize on resources that will be lost if they are not addressed today, and conversely to identify the resources that will still be fully available if funding is deferred. It may be possible to identify unique opportunities for simultaneously accomplishing economic development in Montana and encouraging energy conservation and renewable energy development, but this may present some difficult choices between investing in the existing economic infrastructure and employment patterns versus investing in the economy of the ten to twenty year future.

There is a significant need for both functional and geographic coordination among renewable energy and conservation programs sponsored by federal, state and regional agencies, local governments, utilities and rural electric cooperatives in Montana. The coordination is needed to avoid both overlap and omission. Where authority is dispersed there needs to be a mechanism for accountability. The existence of an adequate information and analytic base is also very important. Energy is viewed as necessary by most people, but there is a tendency to dismiss it in the present because of tight budgets and low energy prices. Existing programs cannot be dismantled if future energy needs are to be met.

In order to appropriately evaluate good and bad opportunities for future investment, the accomplishments of the RECP should be documented. There is a need for risk assessment and analysis in order to be able to identify those investments where the risk is lowest and public benefits are highest. There appears to be a distinction between energy savings that are almost always private sector transactions (i.e., residential and commercial conservation) versus energy savings that involve regulatory systems. There is apparently a stronger prerogative for maintaining government investment and presence in areas where there is already a regulatory system in place.

## VII. CONCLUSIONS AND RECOMMENDATIONS

Considering the large volume of information and advances in renewable energy and conservation technology that have accrued through RECP projects over the years, an important current challenge is to transfer the knowledge to greater numbers of people in order to move closer to the goal of reducing Montana's reliance on non-renewable energy sources.

National polls measuring public opinion within the past year indicate that a majority of citizens feel it is as important to conserve energy today as it was a few years ago. Many energy experts believe that decreased reliance on non-renewable energy sources is desirable for reasons of national security and for having a diverse array of energy supply options available in the future. It appears that the goals of the RECP remain as valid as they have always been. The question of how best to work toward those goals, however, requires a balancing of both short and long term considerations.

With only a fraction of former funding available to the RECP, it is not practical to recommend major new initiatives at this time. However, it is highly appropriate for DNRC to reassess options for achieving the goals of the RECP in the most efficient and effective manner, and for DNRC to reassess its role, as the administrator of the RECP, in advocating those goals. Successful technology transfer involves implementing a diverse array of transfer mechanisms, monitoring results, evaluating barriers to technology use by larger numbers of people and businesses, and recommending options to overcome or reduce the barriers. Within this context, a number of specific ideas have emerged over the biennium which EQC recommends that DNRC or the State of Montana pursue as listed below:

1. DNRC should develop a plan for renewable energy and conservation technologies, including:

a. An evaluation to determine if additional investment of state funds in renewable energy and conservation technologies is warranted and where the investment would be most effective;

b. A summary of the accomplishments of the renewable energy grant and loan program; and

c. Investment criteria, including but not limited to preferential consideration for technologies that have the greatest potential to reduce reliance on non-renewable energy sources and that promote economic development in Montana.

2. There is a significant need for coordination of conservation programs on a statewide basis to obtain the most efficient and effective balance of efforts among state, federal and regional agencies, local governments, utilities, rural electric cooperatives and private sector organizations. Under the auspices of the RECP the DNRC should assume a leadership role in bringing the various parties together to develop a comprehensive and coordinated approach to achieve both the short and long term energy conservation objectives of the involved organizations on a statewide basis.

3. DNRC staff have considerable expertise and familiarity with the various renewable energy and conservation technologies and the most promising areas for additional research, development and demonstration efforts. Based on DNRC staff presentations and input from interested citizens at the joint EQC subcommittee/REAC meeting in May 1986, some



useful direction emerged concerning the research areas that are most reasonable to support with public funds at this time. The plans developed as a result of Recommendations 1 and 2 should specifically identify the areas of technology research and development and technology transfer that should be emphasized by the RECP and identify how that emphasis will be achieved.

4. Managers of the RECP and S & T programs should formally define the relationship of the two programs and, as appropriate, differentiate separate areas of emphasis. The goal should be better coordination between the two programs, avoidance of overlap, and better service to potential clients/applicants.

5. In addition to the RECP the Montana Legislature has incorporated a number of incentives in the taxation statutes to encourage Montana citizens and businesses to invest in renewable energy and conservation technologies, including the following: a) a 10-year property tax exemption for portions of investments in non-fossil energy generation in residences; b) income tax credits for investments in energy conservation and renewable energy systems; c) a deduction from corporate income taxes for investment in energy conservation; and d) income tax credits for commercial investment in wind-generated electricity. Also, electricity from small production facilities must be purchased by public utilities under rates and conditions prescribed by the Public Service Commission (PSC), if small power producers and utilities are unable to agree on a contract or a price. In addition the PSC is directed to include certain conservation purchases and investments in utility rate bases to encourage reductions in electricity and natural gas consumption.

The State of Montana should formally assess whether the current array of tax incentives and provisions concerning utility purchase of renewable energy and conservation, and the direction of the RECP are creating the greatest market stimulation effect at least cost. The assessment should evaluate the cost-effectiveness of the various existing statutory provisions, alternative options used in other states, the past accomplishments of the RECP and current direction of the RECP. The assessment should result in recommendations, as appropriate, to the 1989 Legislature.

## APPENDIX A

### Part 1

#### Renewable Energy Sources Research and Development

##### Part Cross-References

Energy-related and ecological tax incentives, Title 15, ch. 32.

Tax credit for installing alternative energy system, Title 15, ch. 32, part 2.

Coal tax to alternative energy research and renewable resource development, 15-35-108.

Development, protection, and conservation of forest, range, and water resources, 76-13-104.

**90-4-101. Purpose.** The purposes of this part are to stimulate research, development, and demonstration of energy conservation and of energy sources which are harmonious with ecological stability by virtue of being renewable, thereby to lessen that reliance on nonrenewable energy sources which conflicts with the goal of long-range ecological stability and to provide for the funding and administration of such research. Furthermore it is the purpose of this part to stimulate the commercialization of alternative renewable energy and to allow the department to make loans through financial institutions in Montana for this purpose.

**History:** En. 84-7407 by Sec. 1, Ch. 501, L. 1975; R.C.M. 1947, 84-7407; amd. Sec. 1, Ch. 624, L. 1979; amd. Sec. 1, Ch. 356, L. 1981; amd. Sec. 1, Ch. 98, L. 1983.

##### Compiler's Comments

**1983 Amendment:** Near beginning, substituted "and demonstration of energy conservation and of energy sources" for "demonstration and commercialization of energy sources"; in second sentence, inserted "to stimulate the commercialization of alternative renewable energy and"; at end of second sentence substituted "this purpose" for "commercialization of alternative renewable energy".

**1981 Amendment:** Inserted "and commercialization" before "of energy sources" in the first sentence; added the last sentence.

##### Cross-References

Tax credit for installing alternative energy system, Title 15, ch. 32, part 2.

Coal tax to alternative energy research and renewable resource development, 15-35-108.

Financial Institutions, Title 32.

Montana Environmental Policy Act, Title 75, ch. 1.

Solid waste management or material recycling, Title 75, ch. 10.

Development, protection, and conservation of forest, range, and water resources, 76-13-104.

Geothermal resources, Title 77, ch. 4, part 1.

Water resource development, Title 85, ch. 1.

**90-4-102. Definitions.** As used in this part, the following definitions apply:

(1) "Alternative renewable energy source" means a form of energy or matter, such as solar energy, wind energy, or methane from solid waste, capable of being converted into forms of energy useful to mankind, and the technology necessary to make this conversion, when the source is not exhaustible in terms of this planet and when the source or the technology are not in general commercial use.

(2) "Energy conservation" means reducing waste or dissipation of energy or reducing the amount of energy required to accomplish a given quantity of work through increases in efficiency of energy use, production, or distribution.



(3) "Person" means a natural person, corporation, partnership, or other business entity, association, trust, foundation, any educational or scientific institution, or any governmental unit.

(4) "Department" means the Montana department of natural resources and conservation.

(5) (a) "State governmental unit" means:

- (i) the state;
- (ii) the legislature;
- (iii) any executive branch department, office, or agency;
- (iv) the university system; or
- (v) the supreme court or any office thereof.

(b) The term does not include:

- (i) a county, incorporated city, town, or other local governmental unit or a public corporation or district created pursuant to state law; or
- (ii) any other public body of the state not described in subsection (5)(a).

History: En. 84-7408 by Sec. 2, Ch. 501, L. 1975; R.C.M. 1947, 84-7408; amd. Sec. 2, Ch. 98, L. 1983; amd. Sec. 1, Ch. 730, L. 1985.

**Compiler's Comments**

1985 Amendment: Inserted (5).

1983 Amendment: Inserted (2).

**90-4-103. Alternative energy and energy conservation research development and demonstration account established.** There is within the state special revenue fund an alternative energy and energy conservation research development and demonstration account. Moneys are paid into this account under 15-35-108. The state treasurer shall draw warrants payable from this account upon order of the department.

History: En. 84-7409 by Sec. 3, Ch. 501, L. 1975; R.C.M. 1947, 84-7409; amd. Sec. 3, Ch. 98, L. 1983; amd. Sec. 1, Ch. 277, L. 1983.

**Compiler's Comments**

1983 Amendments: Chapter 98 inserted "and energy conservation" after "alternative energy".

Chapter 277 substituted reference to state special revenue fund for reference to earmarked revenue fund.

**Cross-References**

Fund structure, 17-2-102.

**90-4-104. General powers of department.** The department may:

- (1) employ a staff adequate to administer this part;
- (2) retain professional consultants and advisors;
- (3) adopt rules governing applications, granting, administration, and repayment of funds;
- (4) adopt rules governing applications for and administration and awarding of loans;
- (5) adopt rules governing the application for and administration and awarding of grants to state governmental units under 90-4-109;
- (6) consider applications and award grants or loans, subject to the availability of funds and to the appropriation of such funds by the legislature, from the alternative energy and energy conservation research development and demonstration funds for projects that will further the purposes of this part;
- (7) appoint an alternative energy advisory committee composed of representatives of state agencies and citizen members with expertise in alternative

energy and energy conservation matters. The appointment of any such advisory committee shall be in keeping with 2-15-122.

**History:** En. 84-7410 by Sec. 5, Ch. 501, L. 1975; R.C.M. 1947, 84-7410; amd. Sec. 2, Ch. 356, L. 1981; amd. Sec. 4, Ch. 98, L. 1983; amd. Sec. 2, Ch. 730, L. 1985.

#### Compiler's Comments

**1985 Amendment:** In (3) after "granting", inserted "administration, and repayment"; and inserted (5).

**1983 Amendment:** In (5) (now (6)) and (6) (now (7)), inserted "and energy conservation" after "alternative energy".

**1981 Amendment:** Inserted subsection (4); deleted "for grants" after "applications" in (5) (now (6)); inserted "or loans" after "award grants" in (5) (now (6)).

**90-4-105. Applications for grants or loans.** Any person may apply for a grant to enable him to research, develop, or demonstrate energy conservation or alternative renewable energy sources. Any person may apply for a loan to commercialize alternative renewable energy sources. The department shall prescribe the form for applications. Applicants shall describe the nature of their proposed investigations, including practical applications of the possible results and time requirements.

**History:** En. 84-7411 by Sec. 6, Ch. 501, L. 1975; R.C.M. 1947, 84-7411; amd. Sec. 3, Ch. 356, L. 1981; amd. Sec. 5, Ch. 98, L. 1983.

#### Compiler's Comments

**1983 Amendment:** Near beginning of first sentence, deleted "or loan" after "grant"; substituted "develop, or demonstrate energy conservation or alternative renewable energy sources" for "develop, demonstrate, or commercialize alternative renewable energy sources"; and inserted second sentence.

**1981 Amendment:** Inserted "or loan" after "grant" in the first sentence; inserted "or commercialize" after "demonstrate" in the first sentence.

#### Cross-References

General powers of Department, 90-4-104.

**90-4-106. Criteria for grant or loan awards.** The department may award grants or loans to applicants under 90-4-105 in accordance with the following criteria:

(1) A grant may cover a period exceeding 1 year, provided that all funds for the grant must be encumbered or accrued from the program appropriation for the year the grant is authorized.

(2) The department may give preference to projects which are also supported by funding from the federal government or other persons, provided the projects are consistent with the other objectives of the department. The purpose of this preference is to use the alternative energy and energy conservation research development and demonstration account for matching moneys in order to support more substantial research or commercialization.

(3) The department may give preference to research centers unattached to existing educational institutions where several investigators can share supporting services. However, this shall not be interpreted to prohibit the department from awarding grants or loans to existing educational institutions.

(4) The department may give preference to research centers which make information available to individuals, small businesses, and small communities seeking the use of renewable energy sources and energy conservation in their homes, plants, places of business, and small communities.

(5) All information resulting from such research shall be made available to the public.



(6) The department may expend or commit available alternative energy and energy conservation research development and demonstration funds. The department may commit funds for demonstration purposes only when in its judgment such expenditures or commitments have good potential for producing savings of nonrenewable energy sources. The department may not commit funds for demonstration purposes when any of the following conditions are present:

- (a) previous commitments of a similar nature were not productive;
- (b) a similar demonstration has been conducted within close geographic proximity of the geographic location of the proposed demonstration project, other than a project proposed for funding under 90-4-109;
- (c) the proposed demonstration project would not further the purpose of this part.

History: En. 84-7412 by Sec. 7, Ch. 501, L. 1975; R.C.M. 1947, 84-7412; amd. Sec. 4, Ch. 356, L. 1981; amd. Sec. 1, Ch. 402, L. 1981; amd. Sec. 6, Ch. 98, L. 1983; amd. Sec. 3, Ch. 730, L. 1985.

#### Compiler's Comments

*1985 Amendment:* In (6)(b) after "proposed demonstration project", inserted exception clause.

*1983 Amendment:* In (1), deleted "not" before "exceeding 1 year"; substituted language after "1 year" for "and the department may not commit itself to spending funds anticipated to be available more than 1 year after the grant period begins. The department may give an applicant a statement of intent to renew its support of his work, subject to the availability of funds and such other conditions as the department may express"; in (2) and (6), inserted "and energy conservation" after "alternative energy" and in (4) after "renewable energy sources"; at end of (5), deleted "and shall not become the private property of or under the exclusive control of any one company or person".

*1981 Amendments:* Chapter 356 inserted "or loans" after "grants" in the first sentence and in (3); substituted "funding" for "grants" in the first sentence of (2); substituted "projects" for "grants" in the first sentence of (2); added "or commercialization" at the end of (2).

Chapter 402 changed "is under no requirement to" to "may" near the beginning of (6); inserted "The department may commit funds for demonstration purposes only" at the beginning of second sentence of (6); deleted "would be unproductive" after "commitments" and added remainder of subsection (6) relating to criteria for and for not committing funds.

#### Cross-References

Research programs for Montana University System, 20-25-108.

**90-4-107. Renumbered 90-4-111 by Code Commissioner, 1985.**

**90-4-108. Renumbered 90-4-112 by Code Commissioner, 1985.**

**90-4-109. State governmental unit grants.** (1) (a) Prior to July 1, 1987, the department may award grants from the alternative energy and energy conservation research development and demonstration account to state governmental units. These grants must be used to further the purposes of this part by providing money for state governmental units for energy conservation measures.

(b) State governmental units must apply to the department for grants.

(c) The department shall prescribe the form for applications and develop criteria for awarding grants under this section, including provisions requiring matching funds or repayment of grant funds to the alternative energy and energy conservation research development and demonstration account.

(2) (a) After June 30, 1987, the department may award grants from the alternative energy and energy conservation development and demonstration account to such state governmental units that have had projects approved by the legislature.

(b) (i) State governmental units must apply to the department for grants.  
(ii) The department shall prescribe the form for applications and develop criteria for prioritizing grants.

(iii) The department shall prioritize grant applications submitted to it and shall submit its recommendations on the granting of awards to state governmental units with its budget request as provided in 17-7-111. The recommendations must include the names of proposed projects, their cost, and the expected annual energy savings, if any, resulting from the grant.

(c) Each agency awarded a grant by the legislature under the provisions of subsection (2) will have its budget reduced commensurate with the estimated energy savings resulting from the grant.

History: En. Sec. 4, Ch. 730, L. 1985.

90-4-110 reserved.

**90-4-111. Biennial report.** The department shall monitor the grants awarded and shall report its expenditures and other information concerning the implementation and effectiveness of specific projects or programs for which grants were awarded under this part to the legislature at the beginning of each regular legislative session.

History: En. 84-7413 by Sec. 8, Ch. 501, L. 1975; R.C.M. 1935, 84-7413; amd. Sec. 2, Ch. 402, L. 1981; Sec. 90-4-107, MCA 1983; redes. 90-4-111 by Code Commissioner, 1985.

**Compiler's Comments**

1981 Amendment: Inserted "shall monitor the grants awarded and" after "department"; and changed "other activities" to "other information

concerning the implementation and effectiveness of specific projects or programs for which grants were awarded".

**90-4-112. Oversight function of environmental quality council.** The department shall submit periodic reports to the environmental quality council established in 5-16-101 for review and evaluation. The environmental quality council shall make such recommendations as it considers necessary to assure the greatest possible benefit of the program to the people of the state as a whole. Such recommendations may include proposals for legislation.

History: En. Sec. 3, Ch. 402, L. 1981; Sec. 90-4-108, MCA 1983; redes. 90-4-112 by Code Commissioner, 1985.



## CHAPTER NO. 8

[HB 39]

AN ACT GENERALLY REVISING THE RENEWABLE ENERGY SOURCES RESEARCH AND DEVELOPMENT STATUTES; PROVIDING FOR THE ADOPTION OF RULES FOR THE REPAYMENT OF GRANTS TO STATE GOVERNMENTAL UNITS; REQUIRING A BIENNIAL REPORT FOR GRANTS TO STATE GOVERNMENTAL UNITS; REQUIRING THAT GRANTS TO STATE GOVERNMENTAL UNITS EITHER BE REPAID OR THAT AGENCY BUDGETS BE REDUCED COMMENSURATE WITH DOCUMENTED ENERGY SAVINGS; REQUIRING THAT GRANTS TO STATE GOVERNMENTAL UNITS BE ADMINISTERED ACCORDING TO TITLE 18, CHAPTER 2, MCA, BY THE DEPARTMENT OF ADMINISTRATION; ESTABLISHING AN ANNUAL ALLOCATION OF FUNDS; TRANSFERRING MONEY TO THE GENERAL FUND FROM THE ALTERNATIVE ENERGY AND ENERGY CONSERVATION RESEARCH DEVELOPMENT AND DEMONSTRATION ACCOUNT; AMENDING SECTIONS 90-4-104, 90-4-109, AND 90-4-111, MCA; AND PROVIDING AN IMMEDIATE EFFECTIVE DATE.

*Be it enacted by the Legislature of the State of Montana:*

Section 1. Section 90-4-104, MCA, is amended to read:

**"90-4-104. General powers of department.** The department may:

- (1) employ a staff adequate to administer this part;
- (2) retain professional consultants and advisors;
- (3) adopt rules governing applications, granting, administration, and repayment of funds;
- (4) adopt rules governing applications for and administration and awarding of loans;
- (5) adopt rules governing the application for and administration and awarding of grants to state governmental units under 90-4-109;
- (6) adopt rules governing the repayment of grants to state governmental units and the reduction of agency budgets under 90-4-109;
- (7) consider applications and award grants or loans, subject to the availability of funds and to the appropriation of such funds by the legislature, from the alternative energy and energy conservation research development and demonstration funds for projects that will further the purposes of this part;
- (8) appoint an alternative energy advisory committee composed of representatives of state agencies and citizen members with expertise in alternative energy and energy conservation matters. The appointment of any such advisory committee shall be in keeping with 2-15-122."

Section 2. Section 90-4-109, MCA, is amended to read:

**"90-4-109. State governmental unit grants.** (1) (a) The department may award grants from the alternative energy and energy conservation research development and demonstration account to state governmental units. These grants must be used to further the purposes of this part by providing money for state governmental units for energy conservation measures.

- (b) State governmental units must apply to the department for grants.

(c) The department shall prescribe the form for applications and develop criteria for awarding grants under this section, including provisions requiring matching funds or repayment of grant funds to the alternative energy and energy conservation research development and demonstration account.

(d) *Each agency awarded a grant shall either repay the grant or reduce its budget commensurate with the documented energy savings resulting from the grant.*

(2) *All grants awarded under this section must be administered by the department of administration according to Title 18, chapter 2."*

Section 3. Section 90-4-111, MCA, is amended to read:

**"90-4-111. Biennial report.** The department shall monitor the grants awarded under 90-4-106 and 90-4-109 and shall report its expenditures and other information concerning the implementation and effectiveness of specific projects or programs for which grants were awarded under this part to the legislature at the beginning of each regular legislative session."

Section 4. **Annual allocation of funds.** (1) Each fiscal year the department shall allocate the funds appropriated from the alternative energy and energy conservation research development and demonstration account for the following:

(a) grants under 90-4-104 and 90-4-106;

(b) loans under 90-4-104 and 90-4-106;

(c) grants to state governmental units under 90-4-109;

(d) program administration; and

(e) matching federal energy programs and petroleum violation escrow account money if consistent with the purposes of this chapter.

(2) To assure that the program offers the greatest possible benefits during the fiscal year, the department may reallocate funds among the categories specified in this section based on the availability of funds or the applications it receives and the department's evaluation of the relative merits of each project.

(3) From July 1, 1986, through June 30, 1987, the department may elect not to allocate any funds or accept any applications for the purpose of making grant or loan awards under this part.

Section 5. **Transfer.** (1) On June 30, 1986, \$1,000,000 of the money available to the department of natural resources and conservation in the alternative energy and energy conservation research development and demonstration account of the state special revenue fund must be transferred to the general fund.

(2) On or before June 30, 1987, \$350,000 of the money available to the department of natural resources and conservation in the alternative energy and energy conservation research development and demonstration account of the state special revenue fund must be transferred to the general fund.



Section 6. **Extension of authority.** Any existing authority of the department of natural resources and conservation or the department of administration to make rules on the subject of the provisions of this act is extended to the provisions of this act.

Section 7. **Codification instruction.** Section 4 is intended to be codified as an integral part of Title 90, chapter 4, part 1, and the provisions of Title 90, chapter 4, part 1, apply to section 4.

Section 8. **Effective date.** This act is effective on passage and approval.

Approved June 30, 1986.

# APPENDIX B

## RENEWABLE ENERGY AND CONSERVATION PROGRAM STATE BUILDING ENERGY RETROFIT GRANTS

Revised 12/1/86

RESULT/STATUS

DESCRIPTION

GRANTEE

STATUS

AMOUNT

FY86

SBP-86-3501	Active	Montana State University	The energy retrofit was funded in	Work is currently in progress;
\$24,278 G.A.	exp 12/31/86	Gaines Hall	conjunction with a project initiated	approximately 80 percent of mechanical
RECP		George Nolan	by MSU to upgrade the ventilation	work and 95 percent of envelope work
SBP-86-3503		Department of Administration	in the chemistry labs for health	is done. If ventilation rates had been
\$87,825 G.A.		Helena, MT 59620	and safety reasons. The cost of the	increased for health and safety reasons
RECP			energy portion of the project is	without the addition of a heat recovery
\$71,568 G.A.			\$185,535 with an estimated payback	system, energy costs would have increased
Federal(ICP)			of 7.8 years. Conservation measures	substantially.
\$1,864			includes: heat recovery for the	
Agency Match			exhaust fans in the new ventilation	
			system, insulation of walls and	
			plenums, weatherstripping, controls	
			for the automatic snow melt system,	
			and closure of some of the north	
			glazing with insulated panels.	
			Partial funding was provided through	
			the Federal Institutional Conservation	
			Program (ICP) which is administered	
			by DNRC.	

SBP-86-3502	Active	Montana Department of	Total project cost is \$116,090	The project is well underway with several
\$94,995 G.A.	exp 6/30/87	Hillways	with a resulting simple payback of	measures completed, including the installa-
RECP		Billings Headquarters	7.0 years. Measures to be installed	tion or modifications of: paddle fans,
\$21,095		Division	include: paddle fans, caulking,	thermostats, overhead doors, one hour timers,
Agency Match		George Swartz	weatherstripping, shop window insula-	unit heaters, and wall insulation. Metering
		Department of Hillways	tion, one-hour timers for lights in	equipment to monitor the success of the
		Helena, MT 59620	storage areas and dual thermostat	project has also been installed. Roof work
			timers for other areas, new windows,	is in progress and storm windows have been
			storm windows, high efficiency	ordered. This complex is similar to
			unit heaters, insulation of road oil	several other division headquarter complexes
			tanks, roof and wall insulation,	and results will be applicable to all
			and overhead garage doors. The	complexes.
			multi-zone heating system, shop	
			radiant floor system, and other over-	
			sized heating systems will be analyzed	
			and refurbished.	

G.A. - Grant Award  
A.F. - Amount Expended



RENEWABLE ENERGY AND CONSERVATION PROGRAM  
STATE BUILDING ENERGY RETROFIT GRANTS

Revised 12/1/86

RESULT/STATUS

AMOUNT	STATUS	GRANTEE	DESCRIPTION	RESULT/STATUS
SBP-86-3504 \$38,700 G.A. RECP	Active exp 12/31/87	Montana State University Lewis Hall Edward Rice Bozeman, MT 59717	Total cost of the project is \$49,600 with a simple payback of 7.1 years. Conservation measures include installing exit lights, thermostatic control valves, pipe insulation, steam control and automatic temperature setbacks, as well as adding wall insulation and replacing corridor lights.	Night setback thermostats have been installed and lights are close to being replaced. Insulation of steam pipes and hot water pipes are underway. The remaining work is in the design phase and will be complete next summer when the building is not fully occupied.
\$5,450 G.A. Federal [ICP] \$5,450 Grantee Match				
SBP-86-3505 \$41,730 RECP	Active exp 12/31/87	Montana State University Romney Gym Edward Rice Bozeman, MT 59717	Total cost of the project is \$66,430 with an estimated simple payback of 3.9 years. This project is partially funded by a grant from the federal Institutional Conservation Program. The DNRC grant provides pipe insulation, steam system controls, night setback thermostats, wall insulation, and replacement of inefficient lights. The federal grant provides thermostat controls, pipe insulation, and a pool cover.	Night setback system is 100% complete and light replacement is about half done. Other measures are currently being installed or are in the design stages. Some measures, such as interior wall insulation, will be completed next summer when there are fewer classes and people using the building.
\$12,350 Federal [ICP] \$12,350 Grantee Match				

# RENEWABLE ENERGY AND CONSERVATION GRANTS

Revised 12/1/86

RESULT/STATUS

DESCRIPTION

GRANTEE

STATUS

AMOUNT

FY86

RAE-86-1071  
\$87,500 G.A.

Active  
exp 9/30/87

National Center for  
Appropriate Technology  
Barbara Miller  
P.O. Box 3838  
Butte, MT 59701

Data is being collected throughout the heating season and will be analyzed in late 1987. This grant is based on previous work where the grantee designed the homes and trained builders to construct them.

RAE-86-1070  
\$147,100 G.A.

Active  
exp 10/1/88

Glacier Log Homes, Inc.  
Buck Foster  
5580 Highway 93 South  
Whitefish, MT 59923

The design for the building and heating system was completed and includes a 1.5 million Btu/hr furnace that is built in Montana. System will be fueled by waste wood material produced by the log home manufacturer. If successful, the grant will be repaid.

RAE-86-1069  
\$ 5,025 G.A.  
RECP  
\$16,201 G.A.  
Federal

Active  
exp 10/1/87

Bitter Root RC&D  
Dave Lewis  
909 South Avenue  
Missoula, MT 59801

A bibliography on current literature covering wood pellet production and use was completed as the first step in the agreement.

RAE-86-1068  
\$120,212 G.A.  
RECP  
\$ 34,508 G.A.  
Federal

Active  
exp 1/31/89

A.C. Lewis  
P.O. Box AU  
Libby, MT 59923

Determine feasibility of converting wood to liquid fuel by electro-chemically activating carbon and water to produce hydrogen and carbon monoxide gases and a liquid fuel that is similar to diesel.

Grantee is working to raise matching funds of \$160,000 before project begins.

RAE-86-1067  
\$40,205 G.A.

Active  
exp 11/30/88

Montana State University  
Dr. Daniel Shafer  
Bozeman, MT 59717

Experiments proceeding with sunflower oil. Site visited in October, 1986.

RAE-86-1066  
\$69,962 G.A.

Active  
exp 6/30/88

Renewable Technologies, Inc  
Bill Black  
P.O. Box 4113  
Butte, MT 59702

Completed construction of the second Laboratory scale reactor for delignification enzyme. Site inspection approving the system was done in November, 1986.

RAE-86-1065  
\$54,166 G.A.

Active  
exp 2/15/89

Montana State University  
Dr. Warren Scarrah  
Bozeman, MT 59717

Experiments run investigating the effects of a number of pyrolysis process variables that may be important to fuel yield and quality. Site visited in October, 1986.

G.A. - Grant Award  
A.E. - Amount Expended

Grant award amount includes original grant and in a few cases additional amounts added through budget amendments. These additional funds may not have been added in the same year the grant was made.



# RENEWABLE ENERGY AND CONSERVATION GRANTS

Revised 12/1/86

## RESULT/STATUS

## DESCRIPTION

## GRANTEE

## STATUS

## AMOUNT

FY85

RAE-85-1062  
\$13,042 G.A.

Montana Cooperative  
Extension Service  
Dr. Michael P. Vogel  
Taylor Hall, MSU  
Bozeman, MT 59717

Energy education project for  
youth based on the 4H Program.  
It is available for schools and  
all youth groups.

Over 75 hands-on energy activities that  
address energy trends, issues, resources  
and energy use in Montana have been  
designed and collected in a workbook.  
The Grantee has produced 1,000  
copies of the workbook, provided training  
to 4-H leaders on its use and produced  
radio & TV spots and an energy exhibit  
promoting the 4-H Energy Project.

RAE-85-1061  
\$16,913

Montana Cooperative  
Extension Service  
Dr. Michael P. Vogel  
Taylor Hall, MSU  
Bozeman, MT 59717

Develop, produce and promote 5  
video tape presentations on  
energy efficient design and  
construction techniques for homes.

Videos are expected to be completed  
by the end of December 1986.

RAE-85-1060  
\$24,405 G.A.  
Balance  
\$15,178

Montana State University  
Gerald L. Westesen  
Agricultural Engineering  
Department  
Bozeman, MT 59717

Determine the potential of  
using wind power to pump water  
for irrigation system. Evaluate  
crop needs, water storage needs  
and cost.

Identification of crop water requirements  
and evaluation of using wind power to  
irrigate farm land has been done. Research  
indicates that wind powered irrigation at  
this time is not an economically viable  
alternative. Should electric rates go up  
in the future it may be reasonable  
in some areas. Work on wind-powered  
irrigation system computer models is  
progressing.

RAE-85-1059  
\$15,216 G.A.  
\$15,205 A.E.

Glasgow Thermal  
and Solar Systems  
George Austin  
Box 629  
Glasgow, MT 59230

Design, build and test several  
heat retention and solar energy  
design modifications to stock  
watering tanks.

Project indicates that insulation alone  
prevents freezing in all but the most severe  
weather and that addition of solar heating  
measures prevents freezing in all weather  
extremes. Insulating alone can save \$200-  
\$300 in transportation costs per year on  
a large ranch.

RAE-85-1058  
\$12,050 G.A.  
RECP  
\$8,057 G.A.  
Federal  
Balance  
\$2,571  
RECP

Greenough Lumber, Inc.  
John Host  
Box 358 Star Route  
Greenough, MT 59836

Determine the amount of fuel  
that could be produced from  
waste materials such as bark  
and planer shavings at small  
timber processing operations  
and potential additional revenues  
for these operations.

Fuelbark recovery system was completed and  
operated through the summer of 1986. Baseline  
data was collected. Fuelbark recovery  
data was partially completed and the project  
is now waiting for Greenough Lumber to  
resume processing to obtain the  
remaining information and evaluate  
the cost effectiveness of the operation.

RAE-85-1056  
\$27,811 G.A.  
Balance  
\$17,151

Montana State University  
Dr. William Larsen  
Bozeman, MT 59717

An information base on state-of-the-art  
gasification technology has been completed.  
Viable technical alternatives for  
agricultural gasification systems have  
been identified and evaluated. A workshop  
or seminar presenting this information to  
Montana grain or livestock producers is  
planned.

# RENEWABLE ENERGY AND CONSERVATION GRANTS

Revised 12/1/86

## RESULT/STATUS

## DESCRIPTION

## GRANTEE

## STATUS

## AMOUNT

RAE-85-1055 \$133,473 G.A. Balance \$57,094	Active exp 5/31/87	Renewable Technologies Inc. Bill Black P.O. Box 411 Butte, MT 59702	Improved monitoring and control of solid state culture reactors for ambient temperature starch hydrolysis. In this process, a specially developed enzyme is used to produce alcohol from grain without cooking.	Grant is a result of previous successful grants. A small commercial enzyme production plant is being designed, and financing is being arranged. The grant will be repaid if the commercial plant is constructed.
RAE-85-1054 \$200,164 G.A. Balance \$54,988	Active exp 6/6/87	Eastern Agricultural Research Center Jerald W. Bergman, Ph.D. P.O. Box 393 Sidney, MT 59270	Research to find strains of safflower seeds with high oleic fatty acid content that can be used as a fuel.	4880 varieties of safflowers were grown and tested in 1985. Oil potential is higher than expected and very promising. 5400 additional strains are being explored. Research is also being done on enhancing byproduct value and improving the economics of safflower oil production. The total project cost is \$367,000.

## FY85 RFP/Contracts

RAE-85-1064 \$29,648 G.A. Balance \$17,192	Active exp 4/30/87	Intermountain Ambient Ben Myren P.O. Box 5106 Missoula, MT 59806	Monitor wind activity for 2 years in five locations.	Data is currently being collected and analyzed on four separate sites - Ennis, Ringling, Whitlash, Whitehall and Augusta. A history of wind activity is being created for these areas for use in the future as technology and demand create a need. The Bureau of Reclamation is analyzing the data collected.
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RAE-85-1063 \$13,723 G.A. Balance \$2,886	Active exp 3/30/87	Renewable Technologies, Inc. Ken Runnion P.O. Box 4113 Butte, MT 59701	Develop a Montana Biomass permitting handbook identifying all environmental, safety, and other regulatory permits, licenses and requirements needed for the construction and operation of a bioenergy project.	500 copies of the Biomass Permitting Handbook were printed. They are currently being distributed. A computer data base also was created, allowing for easy updating of the Handbook.
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RAE-85-1057 \$53,008 G.A. Balance \$25,362	Active exp 1/30/88	GeoResearch, Inc. Mike Machler 2815 Montana Avenue Billings, MT 59101	Assess, analyze and interpret the extent and magnitude of wind energy resources on the Livingston Bench.	Monitoring completed at these sites for one year with exceptional data recovery rate of 92-99%. Resulted in grant extension for additional data. Wind resources may be greater at some sites monitored than at the Livingston wind farm site.
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RENEWABLE ENERGY AND CONSERVATION PROGRAM  
LOANS

Authorized  
DNRC Amount  
Participating Bank

Results/Status

Project Description

Loan Rate

Recipient

FY86

\$174,983

Montana Bank of  
Butte

Harrington Company  
1740 Holmes  
Butte, MT 59701

To expand the fuel grade  
ethanol facility at the R.J.  
Feedlot in Dillon to 414,000  
gallons per year capacity.

The financing has been arranged; the loan is fully  
disbursed. Modifications to the plant are now taking place.

DNRC 6%  
BANK 10%  
[variable]  
BLEND 6.89%  
TERM 10 years  
REPAYMENT Monthly  
MATURITY 8/27/96

FY85

\$299,700

Montana Bank of  
Butte

Harrington Company  
1740 Holmes  
Butte, MT 59701

Construct and install a  
220,000 gal/yr fuel grade  
ethanol facility at the R.J.  
Feedlot in Dillon, MT.

Construction of original plant is complete. Grain is being  
purchased from local farmers to produce alcohol. The byproduct  
is used as feed in the adjoining feedlot operation.

DNRC 8%  
BANK 12.75%  
[variable]  
BLEND 8.48%  
TERM 10 years  
REPAYMENT Annual  
MATURITY 1/25/95

\$99,000

Farmers State Bank

Bitterroot Timber  
Products  
P.O. Box 53  
Darby, MT 59828

Expand wood pellet fuel  
plant at Darby.

Building construction is complete. Plant capacity is 7000  
tons/year; 4-5,000 tons were produced in 1986. The loan  
is not fully disbursed.

DNRC 7.5%  
BANK 14%  
BLEND 8.15%  
TERM 10 years  
REPAYMENT Monthly  
MATURITY 11/16/95

\$108,000

Montana Bank of  
South Missoula

Fred J. & Harlene  
Fortune dba  
Garden City Electric  
4707 Aspen  
Missoula, MT 59806

To construct a facility,  
market and distribute  
wood pellets & pellet stoves.

Pellets and stoves are being sold through Fortune's existing  
fireplace business while their new facility is being finished.  
Payments are being made as scheduled.

DNRC 7.5%  
BANK 14%  
[variable]  
BLEND 8.15%  
TERM 7 years  
REPAYMENT Monthly  
1st 3 months  
interest only  
MATURITY 7/10/93

Loan amounts are the DNRC portion of the loan. Total project costs are higher and would include an additional 10 to 50 per cent of bank financing.

APPENDIX C

CURRENT  
12-8-81

ENERGY STUDY APPLICATIONS RECEIVED  
STATE BUILDINGS ENERGY PROGRAM

1. Department of State Lands, Forestry Division
  - a. Main office (Missoula)
  - b. Southwestern Land Office Building
  - c. Packing Shed
  - d. Fire Coordination Center
2. University of Montana
  - a. Craighead
  - b. Sisson
  - c. Fieldhouse
3. Department of Military Affairs
  - a. Deer Lodge Armory
  - b. Dillon Armory
  - c. Hamilton Armory
  - d. Lewistown Armory
  - e. Miles City Armory
  - f. Plentywood Armory
  - g. Whitefish Armory
  - h. Sidney Armory
4. Department of Fish, Wildlife & Parks
  - a. Residence 6 - Lewistown Hatchery
  - b. Giant Springs Hatchery Shop (Great Falls)
  - c. Giant Springs Hatchery
  - d. Giant Springs Comfort Station
  - e. Helena Warehouse
  - f. Freezeout Lake Shop
5. Department of Administration
  - a. Social and Rehabilitation Services Building
  - b. Office of Public Instruction - 1300 Eleventh
  - c. Mitchell
  - d. 1236 Sixth Avenue
  - e. Cogswell
  - f. 1219 1/2 Eighth Avenue
  - g. Commerce
  - h. 1219 Eighth Avenue
  - i. Star Motel
  - j. Executive Residence
  - k. Capitol Complex
  - l. 326 Washington
  - m. Memorial
  - n. Scott Hart Building
  - o. Old Liquor Warehouse - 920 Front Street
  - p. 1215 Eighth Avenue
  - q. 1225 Eighth Avenue
  - r. Justice
  - s. 1320 Bozeman



- t. 1410 - 1412 Eighth Avenue
- u. Institutions Building
- v. 1205 Eighth Avenue
- w. 1209 Eighth Avenue
- x. Diane Building
- y. Original Governor's Mansion

- 6. Department of Highways
  - a. Highway Headquarters Complex - Great Falls
  - b. Kalispell Headquarters Office
  - c. Butte Headquarters Complex
  - d. Missoula District Office
- 7. Department of Agriculture
  - a. State Grain Lab (Great Falls)
- 8. Department of Institutions
  - a. Montana State Prison
    - 1) High Security Gym
    - 2) Business Administration Office (Old Research Buildings)
    - 3) Old Warden's Residence, Board of Pardons, Staffing Building
    - 4) Ranch Managers Residence
    - 5) Conley Lake Duplex
    - 6) Deputy Warden's House
    - 7) Low Security Support (Present Administration Building)
    - 8) Dairy Dorm
    - 9) Spruce Cottage
  - b. Mountain View School
    - 1) Spruce Cottage
    - 2) Aspen Cottage
    - 3) Cotton Wood Administration Building
    - 4) School
    - 5) Gym
    - 6) Shop
    - 7) Kitchen/Cafeteria
  - c. Pine Hills School
    - 1) Store
    - 2) Maintenance Building
    - 3) Chapel, Auditorium
    - 4) Gymnasium
    - 5) Vo-Tech Building
    - 6) Joseph Lodge
    - 7) Crazy Horse Lodge
    - 8) Custer Lodge
    - 9) Range Rider Lodge
    - 10) Sundance Lodge
    - 11) Russell Lodge
    - 12) Administration
    - 13) Academic School Building

d. Swan River Forest Camp

- 1) Administration
- 2) Lodge
- 3) Mechanical Shop
- 4) Food Service

e. Eastmont Human Services Center

- 1) Cottage III
- 2) Multi-purpose Building
- 3) Cottage I
- 4) Cottage II

f. Montana Developmental Center

- 1) Training 6
- 2) Training 7
- 3) Offices and Training 8
- 4) Donated Items and Sewing Room 9
- 5) Resident Living 10
- 6) Resident Living 11
- 7) Resident Living 12
- 8) Resident Living 13
- 9) Resident Living 14
- 10) Resident Living 15
- 11) Resident Living 16AB
- 12) Resident Living 16C
- 13) Purchasing/Warehouse 20
- 14) Carpenter and Adaptive Equipment 21
- 15) Refrigerated Storage 22
- 16) Central Laundry 24
- 17) Kitchen and Dining Room 25
- 18) Maintenance Shop 30
- 19) Vehicle Grease Shop 31
- 20) Vehicle Wash Shop 32
- 21) Maintenance Storage 33
- 22) Garages 34
- 23) Paint Shop 36
- 24) Pump House #1 42
- 25) Pump House #2 43
- 26) Powerhouse 44
- 27) Pump House #3 47
- 28) Resident Living 50
- 29) Resident Living 55
- 30) Administration and Gymnasium 102
- 31) Resident Living, Training and Medical Services 104

g. Center for the Aged

h. Montana State Hospital

- 1) 101 Administration
- 2) 102 Multi-purpose
- 3) 104 Fire Hall
- 4) 105 Main Garage
- 5) 106 Class Rooms & Garage
- 6) 107 New Heating Plant



- 7) 108 Laundry
- 8) 110 Women's Correctional Center
- 9) 111 O.T. & Nurses Modular
- 10) 112 Forensic Offices Modular
- 11) 113 Administration Annex
- 12) 201 Receiving Hospital
- 13) 205 General Hospital Pharmacy & Storage
- 14) 207 Warren
- 15) 216 85/86
- 16) 217 Intake - Lab, X-ray, Dental
- 17) 218 Maximum Security 56.57
- 18) 219 Geriatrics (Spratt)
- 19) 301 Food Center
- 20) 302 O.T. & Food Storage
- 21) 303 Bakery
- 22) 304 Commissary, Patient's Clothing
- 23) 305 Receiving Warehouse
- 24) 401 Maintenance Hospital Supply & Sewing Room
- 25) 402 Carpenter Shop
- 26) 403 Paint Shop
- 27) 404 Electric Shop
- 28) 405 Plumbing Shop
- 29) 425 No. I Pump House
- 30) 426 No. II Pump House
- 31) 501 Superintendent Residence
- 32) 502 Marie Scanland Apartments
- 33) 505 Residence "C"
- 34) 506 Residence "D"
- 35) 507 Residence "E"
- 36) 508 Residence "F"
- 37) 509 Residence "G"
- 38) 510 Residence "H"
- 39) 513 Residence "M"
- 40) 522 Duplex 1-2
- 41) 523 Duplex 3-4
- 42) 524 Duplex 5-6
- 43) 525 Duplex 7-8
- 44) 526 Duplex 9-10
- 45) 528 Duplex 11-12
- 46) 529 Duplex 13-14
- 47) 530 Duplex 15-16
- 48) 531 Duplex 17-18
- 49) 532 Duplex 19-20
- 50) 534 Duplex 21-22
- 51) 535 Duplex 23-24
- 52) 536 Duplex 25-26
- 53) 537 Duplex 27-28
- 54) 538 Duplex 29-30
- 55) 539 Duplex 31-32
- 56) 540 Duplex 33-34
- 57) 541 Duplex 35-36
- 58) 542 Duplex 37-38
- 59) 543 Duplex 39-40
- 60) 544 Residence #41

- 61) 545 Residence #42
- 62) 546 Pintlar
- 63) 103 Old Chapel and Morgue
- 64) 105A Garage Storage
- 65) 109 Linen Supply
- 66) 205 General Hospital - Storage
- 67) 210 Bolton
- 68) 211 Children
- 69) 306 Old Butcher Shop
- 70) 406 Lumber and Storage
- 71) 407 Greenhouse
- 72) 409 Soiled Laundry Shed
- 73) 411 Furniture Warehouse
- 74) 412 Furniture Warehouse
- 75) 413 Door and Window Storage
- 76) 414 Storage
- 77) 415 Storage
- 78) 416 Storage
- 79) 417 Storage
- 80) 418 Storage
- 81) 421 Steel Chair Storage
- 82) 422 A&B Storage Sheds
- 83) 423 Timber Bridge
- 84) 424 Water Tow Building
- 85) 425 Pump House #1
- 86) 426 Pump House #2
- 87) 428 Mound Cover
- 88) 505A Garage
- 89) 508A Garage
- 90) 509A Garage
- 91) 510A Garage
- 92) 513A Garage
- 93) 527 Garage (10 stall)
- 94) 533 Garage (10 stall)

#### I. Montana Veterans' Home Domiciliary

- 9. Northern Montana College
  - a. Student Union Building
  - b. Married Student Apartments
  - c. Morgan Hall
  - d. Cowan Hall

- 10. Montana State University
  - a. Fieldhouse
  - b. Marsh Lab
  - c. Roberts Hall
  - d. A.J.M. Johnson Hall
  - e. Leon Johnson Hall
  - f. Linfield Hall
  - g. Herrick Hall
  - h. Hamilton Hall
  - i. Wilson Hall
  - j. Creative Arts Complex



- k. H & PE (Health and Physical Education)
- l. Ryon Lab
- m. Physical Plant
- n. Swingle Health Center
- o. Reid Hall
- p. Miller Pavilion
- q. Huffman Building
- r. Montana Hall
- s. McCall Hall



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